

## ***Interactive comment on “Bayesian inversions of a dynamic vegetation model in four European grassland sites” by J. Minet et al.***

**Anonymous Referee #1**

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Dear Authors,

General comments:

The paper is generally well written. I especially liked the methodology part. Although the paper is methodology oriented it remained accessible due to the clarity of writing in this section. However, this clarity is not reflected throughout the whole text and the manuscript lacks a clear focus.

Mainly, while the manuscripts tries to increase model performance (addressing a changing measurement error variance) for four grassland it does not accomplishes this. The end of paragraph 4.2.2 summarizes the paper succinctly: “Overall, while the HE2 inversion framework is arguably more conceptually sound, we found that it does

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not permit to fully remove heteroscedasticity from the residuals while simultaneously leading to a poorer modeling performance in terms of fitting the large observed values.”!

I would like to see the authors address this issue. WHY doesn't it work? What in the model structure might cause this behaviour? Can you address this and make it work? As it stands you have not provided any potential solutions to the measurement error variance problem. Although this shouldn't be an issue if potential solutions are offered or discussed (literature review using studies in other ecosystems?) this isn't the case.

Technical comments:

- Delete paragraph 4.4 and anything which leads to it. If you do not make an effort to optimize for a global parameter set there is little value in discussing the between site differences. It is well established that if your model lacks the specificity to address between site differences different parameterizations are necessary.
- Paragraph 2.3.2 should go in the introductions, as it sets up the issues of the uncertainty in eddy covariance measurements better than what is currently in the introduction.
- Merge 2.2 and 2.3.1 and put this before the model description (I assume this was originally the case as the order of tables 1 and 2 is reversed - first addressing table 2 then 1)

I acknowledge that this is a rather open ended review. Given the well structured methodology I feel confident that the authors can address the above issue with rigor.

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Interactive comment on Biogeosciences Discuss., 12, 1791, 2015.

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